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Successful Medical and Psychological Management of Recurring Chest Pain and Frequent Hospital Admissions in a Patient With Coronary Artery Disease

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PATIENTS WITH coronary artery disease who have symptoms or disability out of proportion to the objective findings present a frustrating dilemma. They do not respond to usual cardiac treatments, visit their physicians frequently, are frequently admitted to hospital to rule out myocardial infarction (MI), and have repeated diagnostic testing to quantify ischemia and to redefine coronary anatomy. Because of their known coronary artery disease and possibly life-threatening symptoms, they tend to receive episodic acute care in emergency departments, intensive care units, and cardiac testing laboratories.

Psychiatric disorders can influence symptoms, disability, and health care use in patients with chest pain with and without coronary artery disease. For example, 30% to 40% of patients with chest pain with normal coronary angiograms have psychiatric disorders (especially panic disorder, major depression, and somatization disorder) producing symptoms (chest pain, shortness of breath, palpitations) and high health care use, despite a good cardiac prognosis.[1-10] In patients with coronary disease, the prevalence of panic disorder and major depression equals or exceeds that in patients with all other disorders seen in general medical clinics.[11-17] Panic disorder can mimic or aggravate coronary artery disease,[18] and patients with this disease who also have major depression have an increased number of cardiac events, degree of disability, and number of hospital days.[19,20]

Behavioral treatment of chest pain can decrease symptoms, disability, and health care use in patients with[21,22] and without[23-25] coronary artery disease. Treatments are carried out in special inpatient or outpatient settings, with groups or individual patients, usually by interdisciplinary teams of behavioral and medical specialists.

We describe a primary care approach to a patient with severe coronary artery disease in whom the integration of medical and behavioral management resulted in a pronounced reduction of disproportionate symptoms, disability, and health care use.

Report of a Case

The patient, a 43-year-old man, had a large anterior myocardial infarction in October 1985 complicated by ventricular tachycardia, ventricular aneurysm, mural thrombus, and left parieto-occipital embolic stroke. Coronary angiography demonstrated three-vessel disease, and bypass grafting and aneurysmectomy were performed. In June 1986 he had a right ventricular MI with ventricular fibrillation; a second angiogram showed increased narrowing of the right coronary artery. In December 1987 he had a small anterior MI; an angiogram showed a newly occluded small vessel.

The patient's risk factors for coronary disease included tobacco use, hypercholesterolemia, and a family history of early coronary disease. His medications included diltiazem hydrochloride, nifedipine, transdermal nitroglycerin, colestipol hydrochloride, lovastatin, cimetidine, and one aspirin tablet daily.

His parents were alcoholic and divorced when he was 10 years old. He lived with his father who had an MI at age 40 and died of a complication of a coronary bypass operation. The patient did not finish high school. He served in the military from 1966 to 1984 and was stationed in Vietnam but did not see combat. He first had chest pains in 1983, and an exercise electrocardiogram (ECG) was normal. After his first MI he was given a $1,700-per-month disability pension for service-con-

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ABBREVIATIONS USED IN TEXT

ECG = electrocardiogram
MI = myocardial infarction

nected heart disease. His (fourth) wife of seven years worked as a collections agent for a jewelry store. Both had teenaged children from previous marriages.

On physical examination his blood pressure was 126/66 mm of mercury, his heart rate was 77 beats per minute, his respirations were 14 per minute, and he was afebrile. Pertinent physical findings included a thoracotomy scar, no chest wall tenderness to palpation, and clear lungs to auscultation. His cardiac examination revealed a regular rate and rhythm with an apical S_4 gallop and a 1 to 2/6 systolic ejection murmur at the left sternal border; there was no jugular venous distention or S_3 gallop. The extremities showed no edema. A neurologic examination with formal neuropsychological testing revealed no residual effects of his stroke.

His ECG showed normal sinus rhythm with left axis deviation, normal intervals, and a chronic loss of R waves, ST segment elevation, and T wave inversion anteriorly. A chest x-ray film showed intact sternal wires and was otherwise normal. Low- and high-density-lipoprotein cholesterol levels, complete blood count, sedimentation rate, electrolyte values, liver and kidney function, and the results of thyroid function tests were within normal limits. Tests for hypercoagulability including antithrombin III, anticardiolipin antibody, protein S, and protein C levels were also within normal limits. A ventilation-perfusion scan of the lungs, a Bernstein test, and an upper gastrointestinal series were normal. Voluntary hyperventilation failed to reproduce his chest pain.

During 1988 the patient was admitted to the hospital a total of 27 times (86 days) for chest pain. He typically presented in great distress, clenching his muscles and grimacing, and unable to speak or move. At these times his wife refused to leave the bedside and demanded that he be admitted immediately to intensive care. Typically he was treated with intravenous narcotics, nitrates, and benzodiazepines until an MI was ruled out, and then he was discharged several days later pain free. Angiography in 1988 for recurrent episodes of chest pain showed progressive disease but patent grafts and a mildly decreased left ventricular ejection fraction of 0.44 (44%). Subsequent exercise testing with myocardial thallium imaging consistently showed extensive previous infarctions, minimal ischemic changes, and minimal exercise-induced left ventricular dysfunction.

Psychiatric consultation was attempted during some of his hospital admissions, but was deferred by the treating physicians or declined by the patient. On a later evaluation he did not meet diagnostic criteria for panic disorder, major depression, a somatoform disorder, or other psychiatric disorders.[26] Our strongest diagnostic formulation was that his (realistic) fear of another serious coronary event led to his overinterpreting all symptoms as possibly catastrophic. These fears were reinforced by the health care system, which (appropriately) responded by providing emergent but episodic testing and treatment. Also, he became passive and histrionic about his symptoms because of marital and family stress, and this was frustrating to his physicians. What was missing was an approach that combined medical management of his coronary artery disease with psychological management of his symptoms and behavior in a primary care setting.

Treatment Approach

General

The patient was referred to two of us (G.H.G., a general internist, and L.H.B., a clinical psychologist) for help in developing alternative approaches to his care. The patient and his wife met with us in the general medicine clinic. We acknowledged the presence and seriousness of his symptoms, expressed empathy for his frustration over current treatment efforts, and collaborated with the patient, his wife, and his cardiologists to define thresholds for admission to the hospital and for the administration of medications, including narcotics. By scheduling regular monthly visits, consolidating the number of professionals and decisions involved in his care, and actively involving the patient and his wife in treatment planning, we made his medical care more predictable, less frightening, and less contingent on his having symptoms.

To justify exploring psychosocial aspects of his illness, we noted that many patients with heart disease report that getting upset worsens their chest pains, and we invited him to think about ways that stress might aggravate his heart disease. The patient and his wife were able to identify a number of important stressors. Their children were involved in drug use, truancy, and unwanted pregnancy, and coping with these issues uncovered areas of marital conflict. We suggested that, while we would continue his routine cardiac treatment and be vigilant in evaluating for new heart damage, we could also treat his symptoms by teaching him ways to manage his stress.

Behavioral Treatment

Elements of behavioral treatment in this patient's regimen included the use of a symptom diary,[27,28] relaxation and imagery,[29,30] exposure procedures,[31,32] the setting of realistic goals, and problem-solving techniques.[33]

The patient recorded his chest pain and any concurrent stressors in a diary. By discussing his findings on medical visits, we hoped that he would learn to anticipate worsening of symptoms and intervene through relaxation techniques. The patient readily adapted previously learned relaxation techniques and attempted to apply these during episodes of chest pain, with little initial success.

At the sixth visit the patient collapsed with intense chest pain and was taken to the emergency department. His vital signs were stable, and his ECG showed no new ischemic changes. We observed that the patient kept his eyes tightly closed and was tensing his face, arms, and chest muscles. When asked about this, he replied that he was trying to make the pain go away by concentrating hard on relaxing imagery.

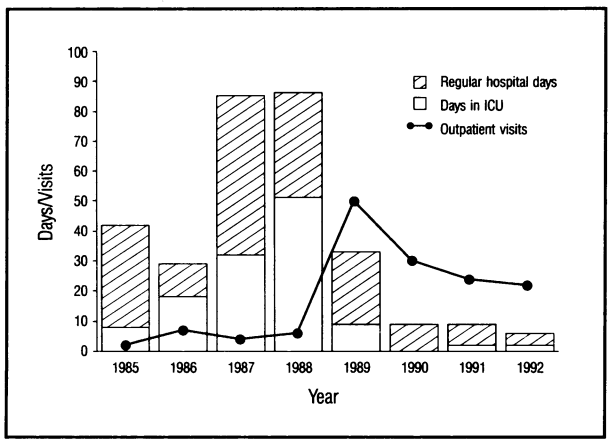

Figure 1.—Annual hospital and clinic use by a patient with recurring chest pain is shown. The patient's inpatient and intensive care unit (ICU) use decreased markedly after primary care-based behavioral treatment was instituted in November 1988. Most clinic visits after that were to the authors or a marital therapist.

This unsuccessful avoidance strategy suggested that exposure procedures might be more successful. We instructed the patient to abandon attempts to make the pain go away and, instead, to allow the pain to run its course in the setting of medical safety provided by the emergency department. During a subsequent hospital admission he practiced the skill of allowing the pain (and associated thoughts, feelings, and physiologic responses) to resolve successfully on its own, without medical intervention. These repeated trials helped him replace his catastrophic thoughts and maladaptive behaviors with positive coping and self-management skills.

Treatment after discharge focused on setting realistic goals for activities despite his pain and learning to pace those activities. Subsequent care involved problem solving with the patient and his wife to help them decide when to come to the hospital and to clarify the goals of emergency care—for example, obtaining an ECG to check for signs of heart damage versus getting help in controlling chest pain.

Because the patient's symptoms remained unreliable indicators of coronary disease activity, we decided with his cardiologists to schedule exercise testing with myocardial thallium imaging every 6 to 12 months. Thus, we removed the contingency of diagnostic testing on his having continued or increased symptoms.

Marital Counseling

The patient and his wife's alliance was strongly based on their caring for his medical condition. The couple was referred to a marital therapy specialist with the goal of helping the patient manage his pain and his relationships with health care professionals. In 11 sessions during the first year of treatment, the patient became more assertive and the couple developed more effective patterns of communication. His wife became more able to address her concerns regarding conflicts with her teenaged stepchildren.

Treatment Outcome

Health Care Use

The patient first saw us in November 1988. He had 27 hospital admissions in 1988, with 86 inpatient days, including 51 intensive care days (Figure 1). In 1989 he was admitted to the hospital 7 times, with 33 days in the hospital that included 9 intensive care days. The patient's inpatient use continued to decrease over the next three years. The use of parenteral narcotics for chest pain also decreased markedly. Conversely, the number of outpatient visits rose from 6 in 1988 to 50 in 1989 and then gradually declined over the following years. Most of these visits were to us or the marital therapist.

Figure 2 shows that, using standard costs—based on billing rates from local community hospitals—for the number of days in the hospital and in the intensive care unit, procedures, and outpatient visits, the cost of this patient's care went from $134,850 in 1988 to $47,000 in 1989 (a reduction of 65%) to $11,750 in 1990 (a reduction of 91%).

Patient Functioning

At the beginning of treatment, the patient reported that he spent most of his time at home reading or doing crafts projects. His relationship with his wife revolved around his medical concerns. After a year of treatment, the patient and his wife got jobs managing a large apartment complex and, ironically, his admissions to the hospital in the third and fourth years of treatment were for orthopedic procedures for injuries related to painting and heavy yard work.

Discussion

Our report differs from previous ones[21,23] in several important ways. First, our patient had severe coronary artery disease with several recent infarctions. Some physicians and nurses were reluctant to pursue behavioral therapy for a given episode of chest pain in this high-risk patient and instead favored aggressive medical treatment. Our ap-

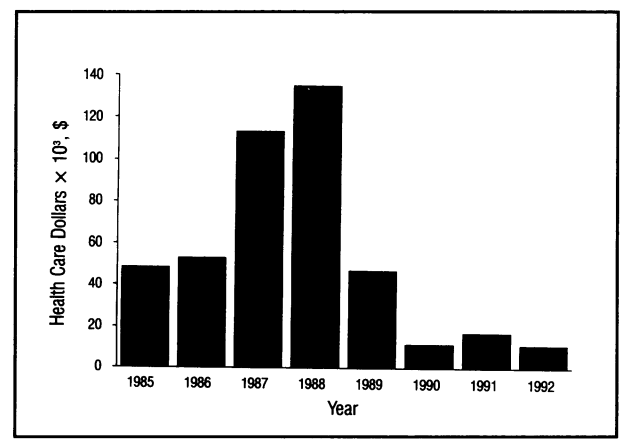

Figure 2.—The patient's annual estimated health care costs are shown. Using standardized costs (see text) for ward and intensive care unit bed days, hospital costs for this patient decreased by 65% in the first and 91% in the second year of treatment.

proach was risky—for example, relying on resting ECG changes to rule out ischemia or infarction during episodes of chest pain. We worked closely with the patient's cardiologists, who accepted this risk given his many evaluations with normal findings and the fact that his previous coronary events were always easy to recognize on an ECG.

Second, our intervention involved taking over the primary medical care of the patient. By consolidating and coordinating his health care, we "treated" the health care system as well as the patient. We were also able to combine medical and behavioral treatments in a way that was acceptable to the patient, while also reducing health care use and costs.

Conclusions that can be drawn from our single case report are clearly limited. The patient's condition may have improved for reasons other than our treatment approach. For example, the patient and his wife relocated during treatment to alter their relationships with some of their children; this move also brought them closer to our hospital. Their decision to move, however, was clearly influenced by their work in our problem-solving and marital therapy sessions. Alternatively, the patient may have had an undiagnosed, self-limiting psychiatric condition such as transient hypochondriasis,[34] hypochondriacal symptoms,[35] or posttraumatic stress disorder[36] in response to his severe myocardial infarctions. Or he may have had panic disorder, major depression, or somatization disorder that affected his symptoms and health care use but failed to reach current diagnostic thresholds.[37-39] He initially received, then discontinued, small doses of imipramine hydrochloride and alprazolam; these medications, along with his behavioral therapy, may have helped treat an unrecognized psychiatric disorder.[40] Although drug and disability seeking were initial diagnostic considerations, they never became important issues in his care.

Successful behavioral therapies for chest pain include reeducating the patient about the meaning of the symptoms; selectively rewarding improved function despite symptoms; self-monitoring of activities and mood; stress management, including anticipating and controlling symptoms with progressive muscle relaxation, biofeedback, breathing retraining, and distraction; physical fitness training; and changing the maladaptive reinforcement behaviors of family members.[21-25] Our combined primary care and behavioral treatment relied on the flexibility and resources of the university-affiliated Department of Veterans Affairs Medical Center and the patient's eligibility for care; as such, it may not be replicable in other settings. Adding mental health services, however, can reduce inappropriate health care costs and use in fee-for-service,[41] military,[42] and managed care[43,44] settings. Future research should be aimed at clarifying ways that primary care and behavioral treatments can be used singly and in combination to treat patients with cardiac and other disproportionate symptoms, disability, and health care use.

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* * *

terminal cancer
last words
"kind man"

he stumbles,
eyes blank with memories—
"incoming," he moans

Alzheimer's disease
the funeral never ends . . .
I love her

quiet eyes,
final exhalation
distant thunder

my husband sleeps
for three years now, he's slept—
I want to be held

exhausted slumber
deathwish waiting for sunrise—
clock's steady ticking

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